

What is claimed is:

1. A cleaning composition comprising:
 - a) a source of calcium ion;
 - b) a source of alkalinity;
 - c) a sequestering agent capable of complexing with calcium ion in an alkaline environment;
 - d) a surfactant; and
 - e) a water-soluble or water-dispersible acid-substituted polymer.
2. The composition of claim 1, wherein the acid-substituted polymer comprises an acid-substituted acrylic polymer.
3. The composition of claim 2, wherein the acid-substituted acrylic polymer is substituted with sulfonic acid, sulfinic acid, phosphoric acid, phosphonic acid, or carboxylic acid on the acid group.
4. The composition of claim 2, wherein the acid-substituted acrylic polymer comprises a sulphonated-hydrophobically modified polyacrylate.
5. The composition of claim 2, wherein the acid-substituted acrylic polymer comprises a hydrophobically modified copolymer.
6. The composition of claim 5, wherein the hydrophobically modified copolymer is modified with styrene or a C₃-C₂₂ alkyl group.
7. The composition of claim 1, wherein the composition further comprises a solvent to form a use solution, and the concentration of the composition in the use solution is from about 0.5 wt. % to about 20 wt. % of the total use solution.
8. The composition of claim 1, wherein the composition has less than about 0.5 wt. % by total weight of the composition as silicate.

9. The composition of claim 1, wherein the composition is prepared by admixing the components a, b, c, d, and e with a solvent.

10. The composition of claim 1, wherein the composition has a molar concentration of calcium ion from about 0.001 to about 1 moles per liter of composition.

11. The composition of claim 10, wherein the composition has about one or more moles of sequestering agent for every mole of calcium ion in the concentrated composition.

12. The composition of claim 1, wherein the composition comprises a concentrated cleaning solution comprising:

- from about 0.001 mole to about 1 mole of calcium ion per liter of solution;
- from about 0.1 wt. % to about 20 wt. % source of alkalinity;
- about one mole or more of sequestering agent for each mole of calcium ion;
- from about 0.05 wt. % to about 20 wt. % surfactant; and
- from about 0.25 wt. % to about 10 wt. % water-soluble or water-dispersible acid-substituted polymer.

13. The composition of claim 1, wherein the composition comprises a use solution comprising:

- from about 0.00001 mole to about 0.1 mole of calcium ion per liter of solution;
- from about 0.01 wt. % to about 10 wt. % source of alkalinity;
- about one mole or more of sequestering agent for each mole of calcium ion;
- from about 0.001 wt. % to about 10 wt. % surfactant; and
- from about 0.01 wt. % to about 1 wt. % water-soluble or water-dispersible acid-substituted polymer.

14. A cleaning composition comprising:

- a) a source of calcium ion;
- b) a source of alkalinity;
- c) a sequestering agent capable of at least partially complexing with calcium ion; and
- d) a surfactant selected from the group consisting of: primary or secondary alcohol ethoxylate, secondary alkane sulfonate, secondary alcohol sulfonate, alpha olefin sulfonate, linear alkyl benzene sulfonate, primary alcohol ethoxy carboxylate, sarcosinates, or mixtures thereof.

15. The composition of claim 14, wherein the surfactant is N-acylsarcosinate, secondary alcohol sulfonate, or linear alkyl benzene sulfonate.

16. The composition of claim 14, wherein the surfactant is secondary alcohol sulfonate.

17. The composition of claim 14, wherein the composition further comprises a solvent to form a use solution, and the concentration of the composition in the use solution is from about 0.5 wt. % to about 20 wt. % of the total use solution.

18. The composition of claim 14, wherein the composition has less than about 0.5 wt. % by total weight of the composition as silicate.

19. The composition of claim 14, wherein the composition is prepared by admixing the components a, b, c, and d with a solvent.

20. The composition of claim 14, wherein the composition has a molar concentration of calcium ion from about 0.001 to about 1 moles per liter of composition.

21. The composition of claim 14, wherein the composition has about one or more moles of sequestering agent for every mole of calcium ion in the concentrated composition.

22. The composition of claim 14, wherein the composition comprises a concentrated cleaning solution comprising:

- from about 0.001 mole to about 1 mole of calcium ion per liter of solution;
- from about 0.1 wt. % to about 20 wt. % source of alkalinity;
- about one mole or more of sequestering agent for each mole of calcium ion; and
- from about 0.05 wt.% to about 20 wt.% surfactant.

23. The composition of claim 14, wherein the composition comprises a use solution comprising:

- from about 0.00001 mole to about 0.1 mole of calcium ion per liter of solution;
- from about 0.01 wt. % to about 10 wt. % source of alkalinity;
- about one mole or more of sequestering agent for each mole of calcium ion; and
- from about 0.001 wt. % to about 10 wt. % surfactant.

24. A cleaning composition comprising:

- a source of calcium ion;
- a source of alkalinity;
- a sequestering agent capable of at least partially complexing with calcium ion; and
- a silicone-containing surfactant.

25. The composition of claim 24, wherein the surfactant is dimethicone propyl PG betaine.

26. The composition of claim 24, wherein the composition further comprises a solvent to form a use solution, and the concentration of the composition in the use solution is from about 0.5 wt. % to about 20 wt. % of the total use solution.

27. The composition of claim 24, wherein the composition has less than about 0.5 wt. % by total weight of the composition as silicate.

28. The composition of claim 24, wherein the composition is prepared by admixing the components a, b, c, and d with a solvent.

29. The composition of claim 24, wherein the composition has a molar concentration of calcium ion from about 0.001 to about 1 moles per liter of composition.

30. The composition of claim 24, wherein the composition has about one or more moles of sequestering agent for every mole of calcium ion in the concentrated composition.

31. The composition of claim 24, wherein the composition comprises a concentrated cleaning solution comprising:

- from about 0.001 mole to about 1 mole of calcium ion per liter of solution;
- from about 0.1 wt. % to about 20 wt. % source of alkalinity;
- about one mole or more of sequestering agent for each mole of calcium ion; and
- from about 0.05 wt.% to about 20 wt.% surfactant.

32. The composition of claim 24, wherein the composition comprises a use solution comprising:

- from about 0.00001 mole to about 0.1 mole of calcium ion per liter of solution;
- from about 0.01 wt. % to about 10 wt. % source of alkalinity;

- c) about one mole or more of sequestering agent for each mole of calcium ion; and
- d) from about 0.001 wt. % to about 10 wt. % surfactant.

33. A method of treating a metal surface, the method comprising: contacting a metal surface with an aqueous cleaning solution comprising the composition of claim 1, 14, or 24; and removing the solution from the metal surface.

34. The method of claim 33 wherein said metal surface comprises an aluminum surface.